

Recovery of Brown Bears in Northern Pakistan

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Biodiversity conservation in developing parts of the world, like South Asia, is challenging due to large-scale poverty, an enormous population, and greater dependence on resources taken from nature. Protected Areas (PAs) serve as important tools for conservation and sustainable development, and the number of PAs has grown impressively in South Asia during the last five decades. However, the traditional approach of excluding people from parks has often hampered the creation of PAs in a struggle between conservation and development. The modern perspective of PA management views resident communities as important stakeholders, and emphasises accommodating the economic and social needs of society. This approach is very relevant in south Asian countries, where the livelihood of rural communities and PAs are essentially linked. However these principles largely remain to be incorporated into national policy in south Asian countries, like Pakistan.

Pakistan's conservation policies and legislation does not allow public participation in PA management nor recognises public rights. Recently, there have been a few initiatives to change the national management paradigm, and bring the concerns of peoples' livelihood into the conservation equation. The creation and management of Deosai National Park (DNP) in Northern Pakistan was one such initiative, which aimed to improve the livelihood of local communities without compromising conservation, particularly the protection of endangered brown bears (*Ursus arctos*). A recent study by Nawaz et al. (2008) evaluated the effectiveness of the park management strategy adopted in the DNP in terms of the trend of the brown bear population. The brown bear, the key species of the park, is an endangered species with rapidly shrinking range in Asia.

DNP (75° 27' N, 35° 00' E) is an 1800 km² alpine plateau, with elevations of 3,500 to 5,200 m. It is a relatively flat

area between narrow valleys and steep mountains, and its vast grazing grounds make a significant contribution to the livelihood of local and nomad communities. The Himalayan Wildlife Foundation (HWF) initiated a project in 1993 to conserve brown bears in DNP. The HWF operated a summer field camp in DNP from 1993-2006, and its staff observed individual bears regularly and documented the information required to estimate population size and reproductive parameters. The following factors helped in individual recognition: 1) distinct color variation among individuals, 2) characteristic white patches, which differed in size and shape, 3) sexual dimorphism: brown bears are sexually size dimorphic, which helped differentiate between sexes, 4) radio-collaring: seven adults were radio-collared, which increased the reliability of the observational study, and 5) genetic analysis verified population size and maternal relationships among individuals that were assumed from field observations.

Counts of brown bears increased from 19 in 1993 to 43 in 2006. Averaged over the study period, there were 41% adults, 8% subadults and 18% young (up to 4 years of age) in the population. Population growth rate was estimated at 5% annually (95%CI: 1.03-1.07), by regressing population size (ln N) on year. This statistically significant population growth suggests that the program has been successful and that the park has met its primary goal. The DNP had a three-fold challenge for management since its inception: a biological challenge to conserve the small brown bear population, a resource management challenge to balance the needs of people without compromising ecological integrity, and a sociopolitical challenge to build the confidence of the local communities and engage them in conservation. The key factors behind the success of the park appear to be the reduction of human-caused bear mortalities and community participation. Community participation was achieved by recognising community rights and sharing park benefits, which was a major departure from the conventional PA management in Pakistan.

The recovery of the bear population is significant, because the population

has the lowest reproductive rate yet documented for a brown bear population, due to a late age of first reproduction (8.25 years), a long reproductive interval (5.7 years), and a small litter size (1.33). Poor habitat quality, low quality food, high seasonality, and extreme weather conditions in the Himalaya probably explain the poor reproductive performance. Considering this low reproduction and known exchange of individuals with neighboring populations, we believe that the observed growth was a sum of reproduction and immigration.

The study documents movement of brown bears between Deosai and adjoining valleys in Pakistan, and also shows connectivity with the Indian populations. We recommend that protection be extended to the adjacent valleys, while allowing communities to sustain their livelihoods. Cross-border cooperation in this area, such as a joint peace park or protected areas along the Line of Control, should be a priority action to conserve bears in the region. Such an initiative would benefit many other threatened large mammals as well.

Brown bears are declining throughout South Asia and often have low

productive rates. Therefore, conservation efforts for brown bears in this region must target reducing human-caused bear mortalities, particularly of adult females. Changes to the legislative and regulatory framework of the PA that would recognise the rights of communities and provide the framework for community participation and benefit sharing should promote the involvement of the local people. Involvement of the local people can increase the efficiency of conservation, in addition to reducing costs and conflicts.

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